Patent Claims

1. A gas turbine (1) for power generation,
having an axial compressor, which is arranged coaxially with respect to a rotationally mounted rotor (5), for compressing an intake gaseous fluid (F), which is at least partially used in a downstream combustion chamber for combustion of a fuel so as to form a hot working medium (19),
having an annular diffuser (15), which is arranged coaxially with respect to the rotor (5) between the axial compressor and the combustion chamber, for distributing and diverting the fluid (F), the diffuser being formed by an outer wall (33) and an inner wall (31),
an annular distribution element (35), which is arranged coaxially with respect to the rotor (5), being supported against the walls (31, 33) by a plurality of hollow rib-like supporting elements (55), and
at least one opening which faces the flow of fluid being provided in the diffuser (15) for the purpose of decoupling a part-stream (51) of the fluid (F),
characterized
in that to decouple a part-stream (51) that can be used as cooling fluid, the opening is provided on the leading edge (48), facing the flow, of the distribution element (35) in the form of an annular gap opening (49) in the central region between the outer wall (33) and the inner wall (31).

2. The gas turbine (1) as claimed in claim 1,
characterized
in that the annular gap opening (49) is segmented along the circumference.

3. The gas turbine as claimed in either of claims 1 and 2, characterized
in that the portion of the flow passage (29) which lies upstream of the distribution element (35) in the diffuser (15) diverges as seen in the direction of flow of the fluid (F).

4. The gas turbine (1) as claimed in one of claims 1 to 3, characterized
in that the annular distribution element (35) is formed in a wedge shape by means of two limb-like walls (37, 39) and is arranged centrally between the two diverging walls (31, 33) of the diffuser (15), so that by means of in each case one wall (37, 39) and the opposite wall (31, 33) of the diffuser (15), it forms an annular part-passage (45, 47) for the fluid.

5. The gas turbine (1) as claimed in claim 4, characterized
in that the two part-passages (45, 47) have a substantially constant cross section over their flow length.

6. The gas turbine (1) as claimed in one of claims 1 to 5, characterized
in that the supporting elements (55), which route the cooling fluid in the interior, are supported against the inner wall (31) located on the radially inner side.

7. The gas turbine (1) as claimed in one of claims 1 to 6, characterized
in that the decoupled part-stream (51) can be routed in the direction of the rotor (5) by the inner supporting elements (55).

8. The gas turbine (1) as claimed in one of claims 1 to 7, characterized

in that the cavity in the supporting element (55) is in communication with an annular passage (57) located radially further inward.

9. The gas turbine (1) as claimed in one of claims 1 to 8, characterized
in that the fluid is compressor air.

10. The gas turbine (1) as claimed in one of claims 1 to 9, characterized
in that a tube (59) with a nozzle (62) runs through the cavity in the outer supporting elements (53), which nozzle (62) opens out downstream of the opening, as seen in the direction of flow, and by means of which a liquid for generating heat of evaporation can be injected into the cooling fluid stream.

11. The gas turbine (1) as claimed in one of claims 1 to 10, characterized
in that a tube (61) extends through the cavity in the outer supporting elements (55) and opens out in a passage which is arranged in the distribution element (35) and is flow-connected to the radially inner part-passage (45), so that a fuel (B) can be introduced into the part-passage (45).

12. The gas turbine (1) as claimed in claim 10, characterized
in that the liquid is water (H_2O).

13. A diffuser (15) for a gas turbine (1) for power generation,
having a diffuser inlet (27), which is followed in the direction of flow of a fluid (F) by a diffuser outlet, with an inner wall (31) on the radially inner side and an outer wall (33) on the radially outer side extending in diverging fashion between them, so as to form a flow passage, and

an annular distribution element (35), which is arranged coaxially with respect to the rotor (5) of the gas turbine (1),

being supported against the walls (31, 33) between the diffuser inlet and diffuser outlet by a plurality of hollow rib-like supporting elements (53, 55),
having at least one opening, which is arranged in the diffuser (15), facing the flow of fluid, for decoupling a part-stream (51) of the fluid (F),
characterized
in that to decouple a part-stream (51) which can be used as cooling fluid, the opening is provided on the leading edge, facing the flow, of the distribution element (35) in the form of an annular gap opening (49) in the central region between the outer wall (33) and the inner wall (31).